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Do state regulations affect payday lender concentration?

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ABSTRACT

Ten states and the District of Columbia prohibit payday loan stores, and thirty-one other states have imposed regulatory restraints on their operations, ranging from limits on fees and loan amounts to the number of rollovers and renewals allowed a borrower. Given the importance of payday lenders to significant segments of the population and the wide variation among state regulatory regimes, our paper examines the extent to which the concentration of payday lenders in counties throughout the country is related to the regulatory environment as well as to various financial and demographic factors. The analysis is based on a unique dataset that has been obtained directly from each state's appropriate regulatory authority.

1. Introduction

Payday loans are among the easiest small loans to obtain. A borrower typically needs only a checking account and documentation of a steady source of income, either from a job or other verifiable source. The loans are extremely short term, typically structured with a due date that coincides with the borrower's next payday, usually within two weeks. A borrower provides the lender, known as

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a payday lender,[1] with either a postdated personal check for the loan amount and lending fee, or the authorization to electronically debit the checking account for the amount due. When the loan is due, the lender deposits the personal check or initiates an electronic withdrawal from the borrower's checking account.

Payday loans differ from bank loans because the borrower is charged a single flat fee, such as $15 per $100 borrowed, rather than recurring interest payments. This practice is allowed even though the flat fees, when converted to interest rates, almost always exceed state usury rates. For this reason and others, however, the payday lending industry has generated much debate, especially in recent years, over its practices and customer base. Amid allegations that payday loans are not only usurious but predatory, payday lenders face varying operational restrictions in states, even being prohibited in some of them.

The controversy over payday lenders centers on the fees they charge and their typical customer base. Consider the fees on payday loans in the following two states. In Indiana the allowable fee of $15 for a $100 loan on a fourteen-day payday loan is equivalent to an annual percentage rate of 390 percent. However, in Missouri the allowable fee of $75 for the same size loan translates into an annual percentage rate of 1950 percent.[2] Certain consumer organizations, advocacy groups, and state attorneys general consider such high interest rates to be outrageous and downright inappropriate, a factor no doubt in the decision by some state governments either to ban payday lending stores or to impose much lower interest rate caps on their loans. In addition, payday lenders are often subjected to accusations that they engage in predatory lending by locating their stores in areas with higher concentrations of low-income individuals, who are unemployed, less educated, and disproportionately African American and Hispanic. Indeed, Ohio Senator Sherrod Brown voiced the concern during a 2014 hearing of the Senate Banking Committee "that payday companies are marketing their high-cost loans to the very people who can least afford them, much like predatory mortgage lenders did in the run up to the housing crisis."[3]

Our paper examines the relationship between the different regulatory restrictions imposed on payday lenders and the concentration of their stores throughout the United States. The examination is based on both county- and state-level data. The latter data enables us to capture differences in the regulatory environment that constrains the prices and other aspects of the loan products that payday lenders may offer. The county-level data when combined with the state-level data enable us to conduct an empirical analysis to determine the extent to which the numbers of payday loan stores correlates to state regulatory restrictions, as well as to the various demographic and economic characteristics of the neighborhoods in which they are located.[4] Based on a new and unique dataset obtained directly from each state regulatory authority, we find that payday lenders operate more stores in those counties located in states whose regulatory regimes are more lenient.

The remainder of the paper proceeds as follows. Section 2 provides a selective literature review. This is followed by an overview of the payday lending industry. Section 4 discusses the problem of obtaining data on the operation of payday lending firms throughout the nation and information on

[1] Payday lenders are also referred to as deferred deposit originators, and their product as payday advances, cash advances, deferred deposits, among other terms. While overdraft credit provided by banks is related to payday credit, Morgan et al. (2012) report that payday loans are typically cheaper than covered overdrafts.

[2] The interest rates in both cases are calculated assuming that both loans are outstanding for a year and the fees are paid every fourteen days. Of course, the rates are much higher if one assumes a new loan is taken out every fourteen days and the same fees are charged.

[3] See Douglas (2014, p. 2).

[4] Due to limited availability of data, the paper focuses on actual storefronts to the exclusion of online payday lenders. However, William H. Sorrell (2014, p. 1), attorney general of Vermont, recently stated that "Online lenders nationwide (currently numbered at over 200) earned over $18 billion dollars in income from high-interest, small-dollar loans made in 2012." Yet, according to the CFPB (2013), these online payday loans still make up a minority of the total loan volume, and the loans are offered with fees equal to or higher than storefront loans. In Appendix 1 we provide information on both in-state and online payday lenders. As the appendix shows, online payday lenders only account for 6.2 percent of all payday lenders. It should be noted that in the late 1990s some payday lenders began partnering with nationally chartered banks and that payday loans became "bank loans" because such banks were not subject to state-imposed fee caps or usury laws. However, the Federal Deposit Insurance Corporation took actions in 2003 and 2005 that, according to Stegman (2007, p. 179), "rendered the rent-a-bank model obsolete."

the regulations governing their operations as well as our approach to overcoming this problem. Section 5 presents and discusses our model and empirical results relating to the regulatory and other determinants of the location and concentration of payday lending stores in counties across the country. Section 6 summarizes our results and suggests future research possibilities to better understand whether there are net social benefits to the payday lending industry.

2. Selective literature review

The conclusions that are reached in much of the existing literature on payday lending reinforce the view that the industry is indeed predatory because it targets economically vulnerable and less-educated individuals. To a far lesser degree, some studies reach the conclusion that there are actual benefits associated with payday lending, such as fewer bounced checks and their associated fees, and fewer bankruptcy filings.

In a relatively early study, Stegman and Faris (2003) analyzed a database of 142 (165) payday lenders operating 807 (902) outlets for the year 1999 (2000) in North Carolina. Their data showed that over the two-year period there were double-digit increases in the number and value of deferred deposit checks, as well as the payday loan fees collected. Net charge-offs increased by 54 percent, reflecting the higher risk of such loans. Their results indicate that lower-income African Americans were more than twice as likely as white non-Hispanics to have taken out a payday loan. Of interest, they found that Hispanics were less likely than other groups to utilize payday loans. Older individuals were also less likely turn to payday lenders than were younger individuals. Furthermore, the results indicate that the number of banks and thrifts in a household's neighborhood had a small but significantly negative effect on the use of payday lenders.

Morgan and Strain (2008) performed an examination of payday lending focusing on Georgia and North Carolina, two states that banned such loans in 2004 and 2005, respectively. Based on an analysis of data for returned checks at Federal Reserve processing centers from 1997 to 2007, complaints filed with the Federal Trade Commission (FTC) between 1997 and 2007, and bankruptcy fillings between 1998 and 2007, they found that households in Georgia bounced more checks, complained more to the FTC about lenders and debt collectors, and filed for bankruptcy protection at a higher rate than did households in states that permitted payday lending. They also found that North Carolina households fared about the same as those in Georgia. In a related nationwide study, Morgan, Strain, and Seblani (2012) examined the period between 1998 and 2008, finding some evidence that while bankruptcy rates decrease after payday loan bans, complaints against lenders tend to increase. Moreover, the authors report that their most robust finding is that returned check numbers and overdraft fee income at depository institutions increase after payday lending bans.[5]

In a more geographically limited study, Gallmeyer and Roberts (2009) conduct a study of payday lenders in the Front Range area (the populous eastern foothills of the Rockies) of Colorado. They perform an analysis of the sociodemographic characteristics of those communities, as measured by median household income, percentage of the population falling substantially below the federal poverty line, and the labor force composition. The authors find that payday lenders are more likely to concentrate their stores in neighborhoods with lower income and moderate poverty, and with higher percentages of ethnic minorities, immigrants, young adults, the elderly, military personnel, and those working in non-management/non-professional occupations.

In a study limited to Oregon and Washington, Zinman (2010) uses data from two 2007 telephone surveys of 1040 payday borrowers to examine some of the effects of restricting access to expensive credit. Oregon imposed a binding rate cap on payday loans that year, whereas Washington did not. Zinman finds that access to payday loans declined in Oregon relative to Washington, suggesting that many borrowers in Oregon shifted into plausibly inferior substitutes, such as bounced checks. In a

[5] Changes in credit supply are proxied by two dummy variables, with 0 representing both before a state banned payday lending and also before a state passed enabling legislation for payday lending, and 1 in both cases after the banning and enabling changes took place. The authors rely on annual store counts obtained from Stephens Inc., an investment bank that tracks the payday lending industry.

related and more recent study, Carrell and Zinman (2014) analyze the impact of payday loan access on three different measures of military job performance in thirty-five states that either allow or prohibit payday lending for the period 1995–2007. Their empirical results indicate that payday loan access adversely affects overall job performance, retention, and readiness.

Combining household survey data and county-level data for thirteen states, three of which prohibit payday lending, Melzer (2011) examines whether payday loan access mitigates financial distress, as some supporters of the industry claim. His results indicate that access to payday lending leads instead to increased difficulty paying mortgage, rent, and utilities bills, and to delays in needed health care.

Morse (2011) also examines whether payday lending exacerbates or mitigates financial distress. Specifically, she considers whether the adverse effects of natural disasters on home foreclosures and small property crimes are mitigated when individuals are able to utilize payday lenders. Her analysis is based on data for California payday lenders at the ZIP code level over the period 1996–2002. In contrast to Melzer, however, she finds that payday lenders provide a beneficial service to individuals facing unexpected financial distress.

In another paper, Bertrand and Morse (2011, p. 1889), in a study based on a survey of 100 stores of a large national payday lending chain over the period May to September 2008, conclude that "...getting consumers to think more long term about the adding up of the dollar costs over time, putting the loan in the context of comparative products to increase its evaluability, and, to a lesser degree, disclosing information on the typical profile of payday loan refinancing significantly reduces the frequency and amount of payday borrowing". Bhutta (2014), on the other hand, uses ZIP code data to analyze the socioeconomic factors correlated with concentrations of payday lenders. Unlike the two studies that find, respectively, negative and positive effects of payday loans on financial well-being, his empirical results indicate little connection in terms of such loans and credit scores, new delinquencies, or the likelihood of overdrawing credit lines.

Quite recently the Consumer Financial Protection Bureau (CFPB), established by the Dodd–Frank Act in 2010, has devoted attention to payday lending. Two white papers were issued focusing on the long-term use of short-term loans, as evidenced by a pattern of repeatedly rolling over, i.e., re-borrowing (2013; Burke, Lanning, Leary, & Wang, 2014). In the 2013 paper, the CFPB finds that the median amount borrowed was $350, with about a third of borrowers having six loans or less and a total dollar amount borrowed of $1500 during a year-long period. In the 2014 paper, using the same data as in the 2013 study, which includes information on over 12 million loans in 30 states, the CFPB found that approximately 80 percent of loans are renewed with another loan within fourteen days.

3. Overview of the payday lending industry

In this and other studies of payday lenders, two important issues arise. First, one must identify in which states payday lenders can legally operate, and the regulatory environment of those states that do permit them.[6] Appendix 1 indicates that ten states and the District of Columbia prohibit payday lenders. The states are Arizona, Arkansas, Georgia, Maryland, Massachusetts, New Jersey, New York, North Carolina, Vermont, and West Virginia, as shown in Fig. 1.

Four states—Connecticut, Montana, New Hampshire, and Oregon—set maximum payday loan rates based on a finance charge for a fourteen-day $100 loan that are far below the typical payday lender rates and are clearly intended to deter the operation of payday lenders within their borders. The rates are as follows: Connecticut, 30 percent; Montana, New Hampshire, and Oregon, each 36 percent. At the other end of the spectrum, six states—Delaware, Idaho, Nevada, South Dakota, Utah, and Wisconsin—set no limits on the rates that may be charged for payday loans. In short, the sky's the limit. Thirty of the remaining states that permit payday lending explicitly specify that triple-digit rates may be charged (see Appendix 2 for this list). And Missouri specifies the highest maximum interest rate that may be charged at 1950 percent.[7] Fig. 2 shows the fairly wide distribution of interest rates that payday lenders

[6] To our knowledge, this is the first time such regulatory information has been collected and used in a study of the payday lending industry.

[7] As a result of the Talent-Nelson Amendment to the John Warner National Defense Authorization Act of 2007, a 36 percent annual percentage rate cap took effect on October 1, 2007, for all payday loans made to active-duty military borrowers.

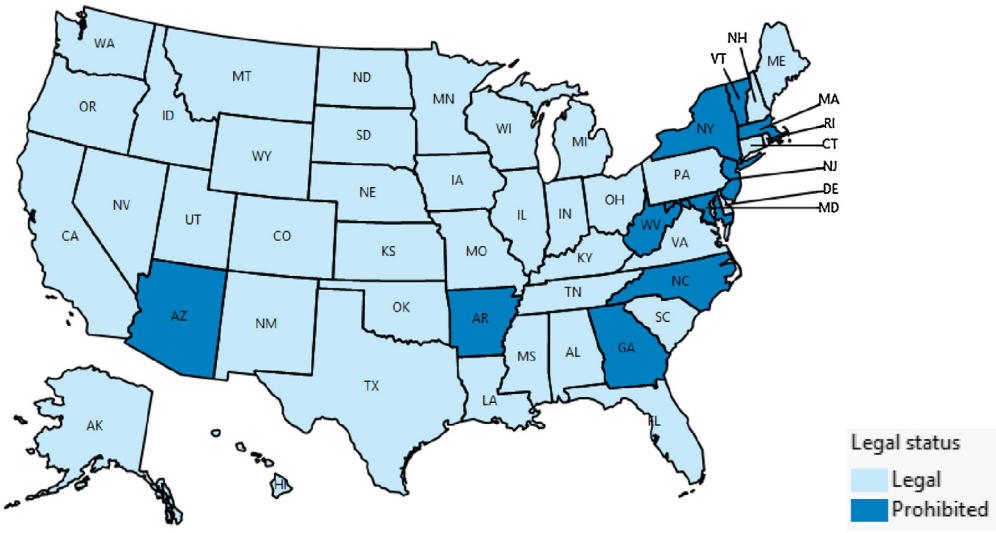

Fig. 1. States that prohibit payday lending.

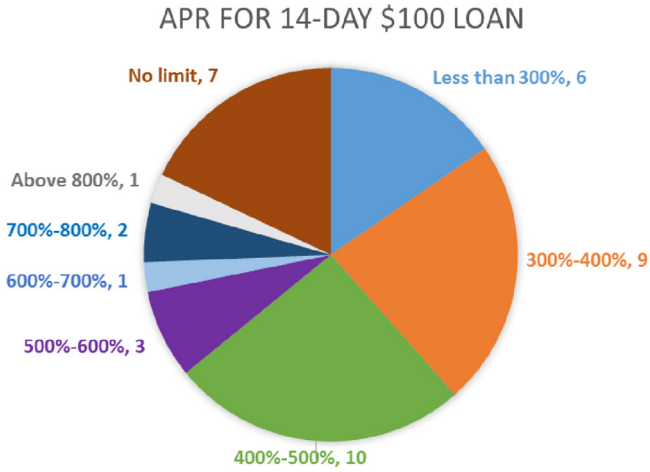

Fig. 2. Distribution of maximum allowable interest rates by payday lenders.

may charge in states, excluding the ten states in which payday lending is prohibited and two states for which no information about the APR is available.

Appendix 2 includes other important information about the regulatory constraints imposed on the payday lending industry. There are, for example, limits on the loan amount in all but four states: Maine, Texas, Utah, and Wyoming. The lowest allowable maximum loan amount is $300, in both California and Montana (no payday lenders are known to be operating in Montana), while the highest allowable maximum loan amount is $50,000, in Oregon. The most frequent maximum loan amount allowed is $500, found in eighteen states.[8]

In addition to limits placed on the loan amount, all but nine states specify upper limits on the terms on these loans. Nineteen states have no specified minimum loan terms. Seventeen states specify a

[8] Two states, Nevada and New Mexico limit the maximum loan amount to 25% of monthly gross income.

maximum loan term, but not a minimum. Of these states, Illinois specifies the longest allowable loan term, at 120 days, whereas Florida, Kansas, Michigan, New Hampshire, and Texas specify the shortest allowable loan term, at seven days. The most frequent maximum loan term is thirty-one days. Of note, Colorado specifies a minimum loan term of six months.

Regulations also specify the number of loans an individual may have outstanding at one time, and the number of times a loan may be rolled over. Eight states—Louisiana, Maine, Minnesota, Mississippi, Nevada, Utah, Wisconsin, and Wyoming—either do not specify or do not set a limit on the number of outstanding loans. Alabama does not limit the number of outstanding loans but instead limits the dollar amount outstanding at any one time. Most states limit simultaneous outstanding loans to one or two.

Twenty-four states prohibit rollovers altogether. Ten states, again listed in Appendix 2, allow between one and four rollovers, while Kansas, Maine, and Pennsylvania do not specify a limit. The Consumer Financial Protection Bureau finds that over 80 percent of payday loans are rolled over or followed by another loan within fourteen days (2014, p. 4).

The second issue that arises in studies of payday lenders involves determining the number of firms operating in the different states. Unfortunately, no central database exists for such information, nor is such information readily available from the various state regulatory authorities. One source of information on the number of payday lenders is Stephens Inc. (2013), which estimates that there were 18,273 payday lending stores in 2012. Another source of information to identify payday lending firms is the North American Industrial Classification System (NAICS) codes. Specifically, the codes include (1) firms primarily engaged in making unsecured cash loans to consumers and (2) those that facilitate credit intermediation, including check cashing services and money order issuance services.[9] These firms encompass non-depository consumer lending and other activities related to credit intermediation.

It should be noted that a few fairly large firms, play a major role in the industry. Advance America, the largest such firm in the United States, was acquired in 2012 by Grupo Elektra, a corporation owned by Ricardo Salinas Pliego of Mexico. Advance America has roughly 2400 stores throughout the United States. However, these are not exclusively payday lenders; some of the stores are pawnbrokers or offer check cashing and other services.

As of mid-2014, we were only able to identify the following firms as publicly traded entities: Cash America International (CSH), QC Holdings (QCCO), EZCORP Inc. (EXPW), First Cash Financial Services (FCFS), and DFC Global (DLLR). All these firms engage not only in payday lending but offer other short-term financial services, such as pawn lending and check cashing. Cash America International has more than 1000 stores; QC Holdings has about 500 outlets, while EZCORP Inc. has about 900 US outlets, with roughly 500 being financial service stores. DFC Global operates in a number of countries, with about 293 outlets in the United States. And First Cash Financial has 309 U.S. stores and others in Mexico.

4. New and unique dataset on payday lenders

As we noted above, studies focusing on the number of payday lending stores usually rely on estimates or a proxy measure for such firms. Appendix 1 reports the number of payday lenders for each state based on the NAICS codes, which was the source of information used by Bhutta (2014).[10] The total for all the states is 29,044. We concluded, however, that the most reliable information on the number and location of payday lending stores as well as the regulatory restrictions under which they operate could only be obtained from state regulatory authorities. We therefore contacted every state regulatory authority, requesting information on the number of payday lenders as well as the specific regulations governing operations in that state. As also seen in Appendix 1, based on this information from the regulatory authorities, the number for all states drops to 16,814, for a difference of 12,230. This means that using a proxy measure, such as the NAICS data, overstates the official number of such lenders by more than 12,000 firms, or 73 percent. For those states that prohibit payday lending, the proxy measure includes 3636 firms—even though the actual number of payday lenders is zero.

[9] The codes are 522291 (consumer lending) and 522390 (other activities related to credit intermediation). Barth et al. (2015) follow Bhutta (2014) and therefore also rely on the two NAICS codes.

[10] Numbers are included, even for the ten states and the District of Columbia that prohibit payday lending.

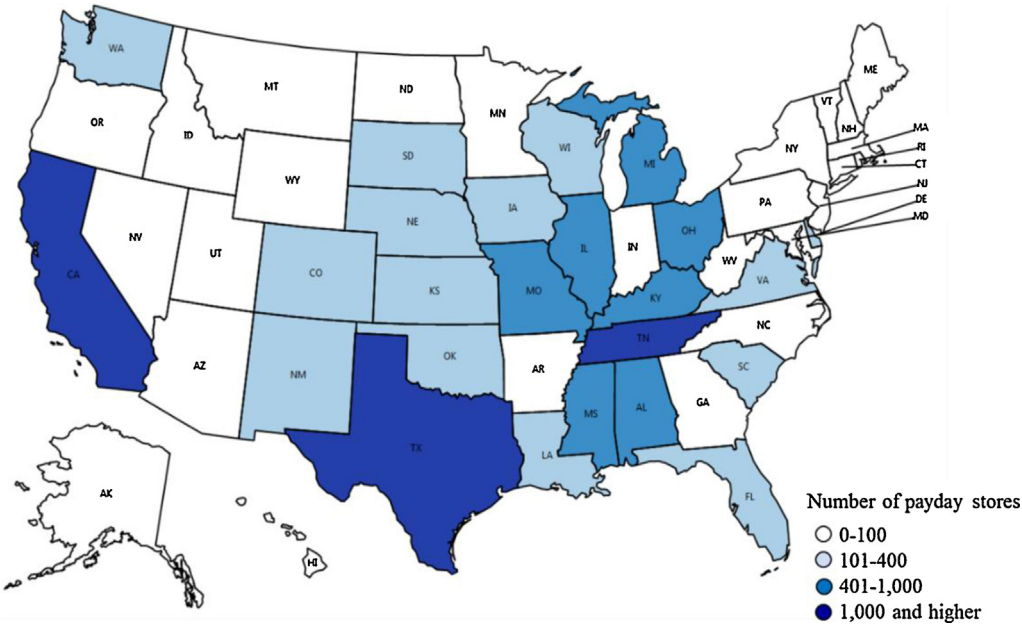

Fig. 3. Number of in-state payday lenders by state.

Fig. 3 illustrates the distribution of in-state payday lenders by state. The greatest numbers are found in California, Tennessee and Texas, with each state having more than 1000 payday lending stores. Texas leads the list, with 3889, while Maine has the fewest, just eleven. Appendix 3 also provides the mean number—6.32—of payday lenders in the 2531 counties where they legally operate, with the minimum number being 0 (which occurs in 1065 counties) and the maximum number being 734 (which occurs in Harris county, Texas).

Fig. 4 shows the number of payday lenders per 10,000 people for each state. Mississippi has the highest number of payday lending stores on this basis, followed by South Dakota, Alabama, Tennessee,

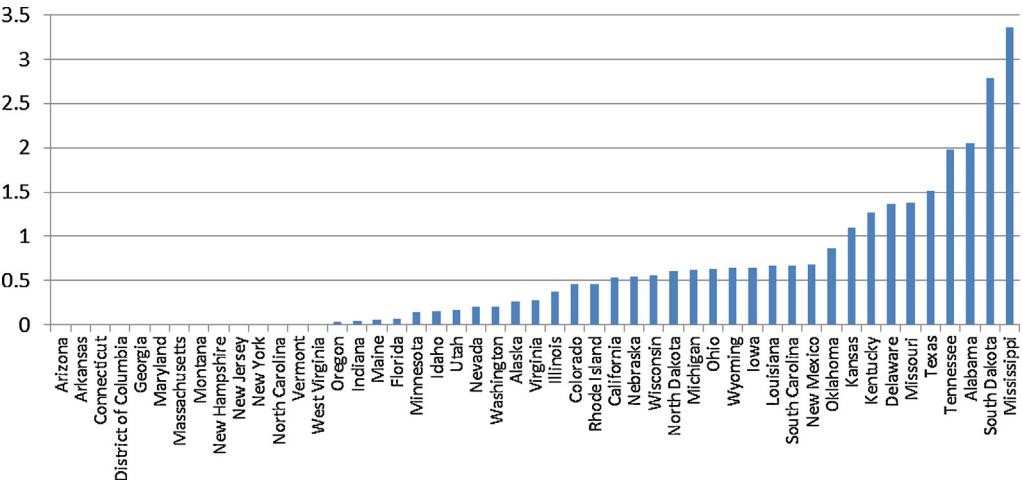

Fig. 4. Number of in-state payday lenders per 10,000 people.

Texas, Missouri, Delaware, Kentucky, and Kansas, which all have more than one store per 10,000 people. Several states have no payday lenders per 10,000 people. These include states that prohibit payday lending, as well as states that impose quite low interest rates, such as Connecticut, Montana, and New Hampshire.

5. Empirical model and results

To address the issue of the concentration of payday lending stores per 10,000 people in counties, we specify the following model:

$$y_i = \alpha_i + \beta_1(\text{regulatory restrictions})_i + \beta_2(\text{financial factors})_i + \beta_3(\text{demographic factors})_i + \beta_4(\text{educational factors})_i + \varepsilon_i, \quad (1)$$

where y_i is the number of payday lending stores per 10,000 people; regulatory restrictions are various state limitations on the operations of payday lenders (to our knowledge these important variables have been excluded in previous studies); financial factors include income per capita, the poverty rate, and the unemployment rate; demographic factors include the percentages of the population that are African American, Asian, Hispanic, age 15 and under, and age 65-plus; educational factors include the percentages of the population that have a high school degree or higher and a bachelor's degree or higher; ε_i is a random error term: and i indexes the 2531 counties in our sample.[11] Appendices 1 and 2 provide the information on the model's dependent and regulatory restriction variables, while Appendix 3 provides descriptive statistics for the same and other explanatory variables separately for all counties, including those counties allowing payday lenders and those counties prohibiting payday lenders.

Appendix 4 provides the simple correlations among the various variables used in our analysis. In this table, given the substantial variation in population among the different counties, as already noted, the focus is on the number of payday lending stores per 10,000 people. Perhaps not surprisingly, the number of payday lending stores is positively and significantly correlated with the percentages of the population that are African American and age 15 and under (indicating a larger family size). The correlations between the number of payday lending stores and the percentages of the population that are white, Hispanic, Asian, and age over 65 are significantly negative. We also find that the correlations between the number of payday lending stores and the percentages of the population that have high school and bachelor's degrees are significantly negative, which also does not seem surprising. Also, there is a significantly negative correlation between the number of payday lending stores and metropolitan areas. In other words, there is a greater concentration of these stores in rural areas undoubtedly due to the higher search and travel costs of obtaining loans from such firms.

Turning to the financial factors, we find a significant negative correlation between the number of payday lending stores and income per capita, while a significant and positive correlation exists between the number of stores and the poverty rate and unemployment rate. At the same time, the number of payday lending stores is significantly negatively correlated with the maximum loan amount, but positively and significantly correlated with the remaining four regulatory restriction variables. As an alternative to the individual restrictions, we constructed a payday regulation index based on the various regulatory restrictions, which is more fully described below. This index is positively and significantly related to the number of payday lending stores. Thus, in general, the number of stores is positively correlated with the leniency of regulations, a finding not previously reported in the literature due to the exclusion of information on the regulatory restrictions placed on payday lenders in those states allowing such firms.

One final correlation is between the number of payday lending stores and the extent to which a county experiences natural disasters. The relationship between this variable, which is described below,

[11] Our study is related to that of Prager (2009) and Barth et al. (2015), and several of the papers they discuss, but relies on more recent and official regulatory data, a somewhat different set of variables to explain the concentration of payday lending stores, and, most important, various restrictions on the operations of payday lenders in states.

Table 1
OLS and Tobit regressions: Number of payday lenders per 10,000 people on selected demographic and financial characteristics in counties for states that permit payday lending.

	1a OLS	1b Tobit	2a OLS	2b Tobit	3a OLS	3b Tobit	4a OLS	4b Tobit
Constant	2.231	64.118	2.025	38.762	1.997	44.235	1.446	44.319
	(0.000)	(0.001)	(0.000)	(0.004)	(0.000)	(0.006)	(0.002)	(0.004)
Black or African American	0.014	0.176	0.014	0.121	0.014	0.150	0.013	0.115
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.002)	(0.000)	(0.002)
Asian	−0.011	−1.273	−0.010	−0.903	−0.012	−1.459	−0.003	−0.754
	(0.193)	(0.021)	(0.220)	(0.029)	(0.142)	(0.015)	(0.756)	(0.117)
Hispanic or Latino origin	−0.009	−0.150	−0.009	−0.166	−0.009	−0.106	−0.012	−0.353
	(0.000)	(0.018)	(0.000)	(0.007)	(0.000)	(0.079)	(0.000)	(0.001)
Age under 15	0.009	−0.274	0.010	−0.048	0.008	−0.274	0.017	−0.194
	(0.230)	(0.188)	(0.173)	(0.789)	(0.272)	(0.196)	(0.029)	(0.360)
Age 65-plus	−0.022	−1.477	−0.022	−1.318	−0.022	−1.465	−0.022	−1.538
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.002)
High school degree or higher	−0.023	−0.869	−0.023	−0.738	−0.022	−0.788	−0.021	−0.940
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Poverty rate	0.031	0.520	0.039	1.011	0.032	0.559	0.031	0.513
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.002)
Unemployment rate	−0.006	−0.517	−0.006	−0.352	−0.006	−0.425	−0.005	−0.449
	(0.304)	(0.015)	(0.357)	(0.037)	(0.375)	(0.035)	(0.436)	(0.030)
APR*Poverty			−0.001	−0.058				
			(0.047)	(0.001)				
APR-squared					−0.002	−0.135		
					(0.135)	(0.010)		
Maximum dollar loan amount	−0.009	−2.040	−0.006	−1.975	−0.006	−1.798		
	(0.006)	(0.003)	(0.004)	(0.002)	(0.035)	(0.004)		
APR for fourteen-day $100 Loan	0.011	0.493	0.027	1.423	0.045	3.574		
	(0.010)	(0.010)	(0.003)	(0.001)	(0.050)	(0.006)		
Maximum number of outstanding loans	0.030	0.358	0.029	0.304	0.030	0.221		
	(0.014)	(0.257)	(0.018)	(0.310)	(0.013)	(0.488)		
Maximum number of rollovers or renewals	0.066	1.779	0.069	2.082	0.071	0.244		
	(0.000)	(0.002)	(0.000)	(0.002)	(0.000)	(0.002)		
Metropolitan area							−0.082	−1.227
							(0.072)	(0.429)
Disasters							0.245	12.166
							(0.000)	(0.002)
Payday regulation index							0.055	2.183
							(0.000)	(0.001)
Sigma		4.522		4.350		4.579		4.644
		(0.000)		(0.000)		(0.000)		(0.000)
Adjusted R^2	*0.218*		0.219		0.218		*0.216*	

is found to be significantly positive, indicating the greater the likelihood that counties are more prone to experiencing financial distress the greater the concentration of payday lenders.

Turning to the multivariate empirical results, the dependent variable employed is the number of in-state payday lending stores per 10,000 people in a county, as shown in Table 1.[12] The ordinary least squares (OLS) results in 1a indicate that the percentage of the population that is African American is positively and significantly related to the number of payday lending stores.[13] However, the coefficient on the percentage that is Hispanic is significantly negative, a result that is consistent with Stegman and

[12] We use only data for in-state payday lenders because we cannot match online payday lenders to counties. As noted earlier, these lenders play a relatively small role both in terms of numbers and loan amounts in the entire industry.

[13] The variance inflation factors (VIFs) (not included) indicate there is no problem with multicollinearity among the variables. However, due to multicollinearity between high school degree and bachelor's degree as well as between the unemployment rate and income per capita only high school degree and unemployment rate are included in the regressions. The results are unchanged when these two variables are replaced by bachelor's degree and income per capita, respectively.

Faris (2003). Family size is not significant, but the percent of the population over age 65 is significantly negative.

The poverty rate enters with a significantly positive sign, which one might expect. Also, as one might expect, the percentage of the population with a high school degree or higher enters with a significantly negative sign. Furthermore, the coefficient on the unemployment rate is not significant. With respect to the regulatory variables, the coefficients on the maximum number of outstanding loans, the APR and the maximum number of rollovers or renewals are all significantly positive, while the coefficient on the maximum dollar loan amount is negative and significant.

Regression 2a includes an interaction term between APR and poverty. The coefficient is negative and significant, suggesting that a higher poverty rate lessens the positive impact of the APR.

To examine whether the concentration of payday lenders per capita is larger in urban areas versus non-urban areas, we sort counties into metropolitan and nonmetropolitan using the classification from the Bureau of Labor Statistics (http://www.bls.gov). We create a dummy variable, metropolitan, that takes a value of one if a county has a metropolitan area and zero otherwise. The results in 4a indicate that metropolitan areas do indeed have a lower concentration of payday lenders per capita than nonmetropolitan areas. This suggests that proximity is an important factor in the location of payday lending stores. We also include a nonlinear variable, APR-squared, in our regressions. As regression 3a shows, the coefficient on the APR-squared term is not significant.

To further examine the relationship between the regulatory environment and the concentration of payday lending stores, we create a payday regulation index that is based on state payday lending restrictions. Specifically, the index contains four restriction measures established by each state that govern the payday lending industry: (1) maximum loan amount ($), (2) APR for fourteen day $100 loan, (3) maximum number of outstanding loans at one time, and (4) number of permitted rollovers. For each measure, we divide all the observations into quartiles and assign a value of one to the first quartile, two to the second quartile and so forth. The payday regulation index is the sum of these four components. A higher value of the index indicates a more lenient regulatory environment.

Regression 4a shows the results using this payday regulation index as an independent variable. The coefficient on the index is positive and significant, indicating that the concentration of payday lenders is greater in counties located in states with more lenient regulatory restrictions. This is a finding unique to our study and is based on our new regulatory data obtained directly from state regulatory authorities.

Payday lenders are often the last resort lenders to borrowers that face liquidity shocks. To proxy for such shocks, we identify counties that were declared disaster areas by the Federal Emergency Management Agency (FEMA) between 2010 and 2014 (http://www.fema.org). We create a dummy variable, Disasters, that takes a value of one if a county experienced a FEMA-declared disaster during these five years. The results when this variable is included are shown in regression 4a. The coefficient on Disasters variable is positive and significant, suggesting that disaster-prone areas are associated with a higher concentration of payday lenders who are able to provide loans to financially-distressed individuals.

Because a fairly large number of observations for the dependent variable are clustered at zero, the empirical model was re-estimated using a Tobit estimator as was done, for example, in the study by Bertrand and Morse (2011). In this case, as shown in Table 1, two main differences emerge in the empirical results. All the significant variables based upon the OLS results, with the exception of metropolitan area, are similarly significant when using the Tobit estimator. However, the percentage of the population that is Asian and the unemployment rate now enter with significantly negative signs (regression 1b). The significantly negative coefficient for the unemployment rate is not unexpected since payday borrowers must have a steady source of income.[14] Also, the coefficient on APR is positive and significant, while the coefficient on APR-squared is now negative and significant (regression 3b).

[14] We also estimated the Tobit model omitting five states, Connecticut, Maine, Montana, New Hampshire and Oregon, due to the low allowable interest rates which raises questions about whether payday lenders actually operate in these states despite such firms not being explicitly prohibited. Indeed, in three of these states there are no payday lenders, while in the other two states there only 8 and 12 in-state payday lenders (see Appendix 1). The empirical results are unchanged after re-estimating the Tobit model when omitting these five states.

This suggests that the APR has a positive relationship to the concentration of payday lenders, but this effect diminishes as the APR increases. Lastly, it should be emphasized that the Disasters variable and the payday regulation index both enter with significantly positive coefficients in the Tobit estimation (regression 4b).

6. Conclusion

Overall, the empirical results indicate the following: (1) there is a significantly positive relationship between the concentration of payday lending stores and the percentage of the population that is African American in all the regressions; (2) the percentage of the population that is Hispanic enters our regressions with a significantly negative sign; (3) the percentage of the population with a high school degree or higher is significantly negative in the regressions; (4) the poverty rate is always significantly positive; (5) the percentage of the population that is Asian enters with a significantly negative sign in the case of three of the four Tobit regressions; (6) the dummy variable for disaster-prone areas is positive and significant for both the OLS and Tobit regressions and; (7) the payday regulation index enters with significantly positive coefficients in both the OLS and Tobit regressions. Most important, our empirical results are consistent with the view that payday lending stores are more concentrated in those counties located in states whose regulatory regimes are more lenient, a new finding that is unique to our study. Of course, much more work is needed to more fully understand the causal mechanisms through which payday lenders impact individuals and, more broadly, the social welfare implications of the payday lending industry.

Appendix 1. Legal status and number rate of payday lenders by state

State	Legal status	Data collected from regulators			Payday lenders based on NAICS[a] codes
		Number of payday lenders	Number in state	Number out of state (on-line)	
Alabama	Legal	997	980	17	1035
Alaska	Legal	25	19	6	9
Arizona	Prohibit	0	0	0	436
Arkansas	Prohibit	0	0	0	36
California	Legal	2033	2010	23	2427
Colorado	Legal	256	234	22	432
Connecticut	Legal	0	0	0	82
Delaware	Legal	347	123	224	126
District of Columbia	Prohibit	0	0	0	29
Florida	Legal	149	135	14	1520
Georgia	Prohibit	0	0	0	1208
Hawaii	Legal	N/A	N/A	N/A	41
Idaho	Legal	51	25	26	212
Illinois	Legal	503	488	15	1248
Indiana	Legal	41	31	10	520
Iowa	Legal	195	195	0	212
Kansas	Legal	335	314	21	305
Kentucky	Legal	550	550	0	648
Louisiana	Legal	403	303	100	1342
Maine	Legal	11	8	3	15
Maryland	Prohibit	0	0	0	232
Massachusetts	Prohibit	0	0	0	126
Michigan	Legal	617	609	8	555
Minnesota	Legal	81	74	7	132
Mississippi	Legal	1013	998	15	1004
Missouri	Legal	865	826	39	972
Montana	Legal	0	0	0	57
Nebraska	Legal	101	101	0	147
Nevada	Legal	91	55	36	316
New Hampshire	Legal	0	0	0	15

State	Legal status	Data collected from regulators			Payday lenders based on NAICS[a] codes
		Number of payday lenders	Number in state	Number out of state (on-line)	
New Jersey	Prohibit	0	0	0	333
New Mexico	Legal	148	140	8	435
New York	Prohibit	0	0	0	685
North Carolina	Prohibit	0	0	0	524
North Dakota	Legal	47	41	6	22
Ohio	Legal	737	735	2	950
Oklahoma	Legal	338	323	15	977
Oregon	Legal	66	12	54	151
Pennsylvania	Legal	N/A	N/A	N/A	219
Rhode Island	Legal	52	49	3	53
South Carolina	Legal	311	311	0	1348
South Dakota	Legal	408	227	181	110
Tennessee	Legal	1283	1259	24	1370
Texas	Legal	3889	3827	62	4623
Utah	Legal	81	47	34	320
Vermont	Prohibit	0	0	0	4
Virginia	Legal	225	225	0	577
Washington	Legal	153	139	14	293
West Virginia	Prohibit	0	0	0	23
Wisconsin	Legal	330	321	9	536
Wyoming	Legal	82	36	46	52
Total (excluding N/As)		16,814	15,770	1044	29,044

[a] NAICS code refers to the North American Industry Classification System.
Source: Survey of state regulatory authorities and http://www.census.gov.

Appendix 2. Regulatory restrictions on payday lenders

State	Legal status	Maximum loan amount ($)	Minimum loan term (days)	Maximum loan term (Days)	Finance charge for 14-day $100 loan ($)	APR for 14-day $100 loan (%)	Max. number of outstanding loans at one time	Rollovers or renewals permitted
Alabama	Legal	500	10	31	17.50	456.25	No limit	1
Alaska	Legal	500	14	Not specified	20.00	520.00	Not specified	2
Arizona	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arkansas	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
California	Legal	300	0	31	17.50	456.25	1	0
Colorado	Legal	500	180	N/A	N/A	N/A	2.5	1
Connecticut	Legal	15,000 under small loan statute	N/A	N/A	17.00	30.03	N/A	N/A
Delaware	Legal	1000	0	60	No limit	No limit	5	4
District of Columbia	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Florida	Legal	500	7	31	16.11	419.00	1	0
Georgia	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hawaii	Legal	600	0	32	17.65	459.00	1	0
Idaho	Legal	1000	0	Not specified	No limit	No limit	5	3
Illinois	Legal	1000	13	120	15.50	403.00	2	0
Indiana	Legal	550	14	Not specified	15.00	390.00	2	0
Iowa	Legal	500	0	31	16.67	433.00	2	0
Kansas	Legal	500	7	30	15.00	390.00	2	Not specified
Kentucky	Legal	500	14	60	17.65	459.00	2	0

State	Legal status	Maximum loan amount ($)	Minimum loan term (days)	Maximum loan term (Days)	Finance charge for 14-day $100 loan ($)	APR for 14-day $100 loan (%)	Max. number of outstand-ing loans at one time	Rollovers or renewals permitted
Louisiana	Legal	350	0	60	30.00	780.00	Not specified	0
Maine	Legal	None	Not specified	Not specified	20.96	43.00	Not specified	Not specified
Maryland	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Massachusetts	Prohibited	6000	N/A	N/A	N/A	N/A	N/A	N/A
Michigan	Legal	600	7	31	15.00	390.00	2	0
Minnesota	Legal	350	0	30	15.00	390.00	Not specified	0
Mississippi	Legal	500	0	30	20.00	520.00	Not specified	0
Missouri	Legal	500	14	31	75.00	1950.00	2.5	6
Montana	Legal	300	0	31	1.39	36.00	1	0
Nebraska	Legal	500	0	34	17.65	459.00	2	0
Nevada	Legal	25% of expected monthly gross income	0	35	No limit	No limit	Not specified	0
New Hampshire	Legal	500	7	30	1.38	36.00	1	0
New Jersey	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
New Mexico	Legal	25% of monthly gross income	14	35	16.00	417.00	2.5	0
New York	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
North Carolina	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
North Dakota	Legal	500	0	60	20.00	520.00	3	1
Ohio	Legal	500	31	Not specified	15.00	390.00	1	0
Oklahoma	Legal	500	12	45	15.00	390.00	1	0
Oregon	Legal	50,000	31	60	15.00	36.00	1	2
Pennsylvania	Legal	25,000	0	Not specified	$9.50 per $100 per year interest plus $1.50 per $50	N/A	Not specified	Not specified
Rhode Island	Legal	500	13	Not specified	10	260.00	3	1
South Carolina	Legal	550	0	31	15.00	390.00	1	0
South Dakota	Legal	500	Not specified	Not specified	Not specified	Not specified	2.5	4
Tennessee	Legal	500	0	31	17.65	459.00	3	0
Texas	Legal	Not specified	7	31	11.87	309.47	2.5	0
Utah	Legal	No limit	0	70	Not specified	No limit	Not specified	5
Vermont	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Virginia	Legal	500	28	Not specified	26.38	687.76	1	0
Washington	Legal	700	0	45	15.00	390.00	3.5	0
West Virginia	Prohibited	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wisconsin	Legal	1500	0	90	No limit	No limit	No limit	1
Wyoming	Legal	Not specified	0	30	30.00	780.00	No limit	0

Source: Survey of state regulatory authorities, authors and Consumer Federation of America (payadayloaninfo.org).

Appendix 3. Descriptive statistics for payday lenders and selected demographic and economic variables at county level

	Legal states					Prohibited states					All states				
	N	Minimum	Maximum	Mean	Std. deviation	*N*	Minimum	Maximum	Mean	Std. Deviation	*N*	Minimum	Maximum	Mean	Std. deviation
Number of payday lender stores	2531	0.00	734	6.32	26.37	545	0	0	0.00	0.00	3076	0	734	5.13	23.98
Number of payday lender stores per 10,000 people	2531	0.00	7.35	0.74	1.04	545	0.00	0.00	0.00	0.00	3076	0.00	7.35	0.60	0.99
% White	2531	3.80	100.00	87.25	15.53	545	22.70	99.80	77.90	18.62	3076	3.80	100.00	85.59	16.51
% Black or African American	2531	0.00	86.20	8.00	13.56	545	0.00	74.80	17.63	17.55	3076	0.00	86.20	9.70	14.81
% Asian	2531	0.00	41.20	1.37	2.56	545	0.00	61.60	2.11	5.07	3076	0.00	61.60	1.50	3.16
% Hispanic or Latino origin	2531	0.00	98.30	8.86	14.24	545	0.00	82.70	6.27	7.87	3076	0.00	98.30	8.40	13.37
High school education (%)	2531	44.90	97.50	84.46	7.17	545	61.90	95.10	82.28	6.39	3076	44.90	97.50	84.07	7.09
Bachelor's education (%)	2531	3.70	72.80	19.38	8.46	545	5.60	59.50	19.83	10.14	3076	3.70	72.80	19.46	8.78
% of population under age 15	2531	0.00	34.80	19.24	3.13	545	0.00	27.00	18.83	2.75	3076	0.00	34.80	19.17	3.07
% of population over age 65	2531	3.80	44.50	16.18	4.40	545	4.00	33.20	15.23	3.74	3076	3.80	44.50	16.01	4.31
Unemployment rate	2531	0.00	27.2	8.38	3.89	545	0.00	21.90	9.90	3.05	3076	0.00	27.20	8.65	3.80
Poverty rate	2531	0.00	49.50	15.99	6.40	545	3.80	47.70	18.12	6.52	3076	0.00	49.50	16.37	6.47
Income per capita	2531	9136	61,312	23,404	5235	545	8809	61,951	23,072	6804	3076	8809	61,951	23,346	5546

Note: This information is based on US Census Bureau Data for 2531 counties in the U.S.

Appendix 4. Correlations among payday lenders and selected demographic and financial characteristics at county level for states that do not prohibit payday lenders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Payday loan stores per 10,000 people (1)	1																			
White (2)	−0.24	1																		
	(0.00)																			
Black or African American (3)	0.32	−0.81	1																	
	(0.00)	(0.00)																		
Asian (4)	−0.07	−0.22	0.02	1																
	(0.00)	(0.00)	(0.32)																	
Hispanic or Latino origin (5)	−0.06	−0.07	−0.10	0.14	1															
	(0.00)	(0.00)	(0.00)	(0.00)																
Age under 15 (6)	0.12	−0.22	0.02	0.01	0.29	1														
	(0.00)	(0.00)	(0.28)	(0.64)	(0.00)															
Age 65-plus (7)	−0.14	0.37	−0.21	−0.34	−0.21	−0.55	1													
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)														
High school degree or higher (8)	−0.28	0.33	−0.33	0.16	−0.42	−0.21	0.11	1												
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)													
Bachelor's degree or higher (9)	−0.14	0.02	−0.07	0.49	−0.01	−0.10	−0.25	0.58	1											
	(0.00)	(0.44)	(0.00)	(0.00)	(0.58)	(0.00)	(0.00)	(0.00)												
Poverty rate (10)	0.34	−0.48	0.41	−0.14	0.15	0.10	−0.11	−0.65	−0.38	1										
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)											
Unemployment rate (11)	0.23	−0.47	0.41	0.00	−0.01	0.07	−0.19	−0.41	−0.27	0.60	1									
	(0.00)	(0.00)	(0.00)	(0.81)	(0.74)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)										
Income per capita (12)	−0.26	0.19	−0.22	0.42	−0.08	−0.14	−0.06	0.63	0.75	−0.72	−0.43	1								
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)									
Maximum dollar loan amount (13)	−0.09	0.05	−0.09	0.03	0.17	−0.01	0.03	0.01	0.04	0.01	0.04	0.02	1							
	(0.00)	(0.02)	(0.00)	(0.15)	(0.00)	(0.46)	(0.19)	(0.67)	(0.06)	(0.61)	(0.04)	(0.36)								
Finance charge for (14)	0.13	0.06	−0.09	−0.04	−0.16	0.12	−0.01	0.09	−0.02	−0.03	−0.04	−0.06	−0.06	1						
	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.64)	(0.00)	(0.25)	(0.18)	(0.03)	(0.00)	(0.00)							
APR for 14-day $100 loan (15)	0.15	0.05	−0.07	−0.04	−0.16	0.13	−0.01	0.07	−0.03	−0.02	−0.05	−0.06	−0.13	0.99	1					
	(0.00)	(0.01)	(0.00)	(0.04)	(0.00)	(0.00)	(0.51)	(0.00)	(0.09)	(0.27)	(0.02)	(0.00)	(0.00)	(0.00)						
Maximum number of loan outstanding (16)	0.11	0.00	0.07	−0.09	−0.05	0.13	−0.05	0.05	−0.01	0.00	−0.06	−0.02	−0.03	0.39	0.37	1				
	(0.00)	(0.83)	(0.00)	(0.00)	(0.02)	(0.00)	(0.01)	(0.01)	(0.73)	(0.86)	(0.00)	(0.33)	(0.11)	(0.00)	(0.00)					
Maximum number of rollovers (17)	0.10	0.14	−0.17	−0.04	−0.11	0.09	0.06	0.15	0.05	−0.09	−0.15	−0.01	0.07	0.55	0.53	0.09	1			
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.56)	(0.00)	(0.00)	(0.00)	(0.00)				
Disasters (18)	0.12	0.01	0.08	−0.16	−0.11	0.02	0.05	−0.06	−0.10	0.03	−0.09	−0.08	−0.08	−0.06	−0.05	−0.05	0.06	1		
	(0.00)	(0.58)	(0.00)	(0.00)	(0.00)	(0.44)	(0.01)	(0.00)	(0.00)	(0.18)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.01)	(0.00)			
Metropolitan areas (19)	−0.06	−0.07	0.07	0.25	0.05	0.15	−0.32	0.15	0.30	−0.18	0.03	0.27	0.00	0.00	0.00	−0.02	−0.07	0.00	1	
	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.97)	(0.96)	(0.95)	(0.29)	(0.00)	(0.90)		
Payday regulation index (20)	0.11	0.04	−0.08	−0.05	0.05	0.14	−0.04	0.04	0.01	−0.03	−0.09	−0.08	0.19	0.77	0.75	0.62	0.51	−0.14	−0.03	1
	(0.00)	(0.05)	(0.00)	(0.02)	(0.01)	(0.00)	(0.04)	(0.04)	(0.52)	(0.18)	(0.00)	(0.68)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.10)	

Note: *p*-Values are in parentheses.

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